U.S.CIRCUIT COURT, DIST. OF CONNECTICUT

National Phonograph Co.) In Equity no.1076
vs.) In Equity no.1103
American Graphophone Co.) On Pats. 667,662
713,209

ARGUMENT OF FREDERIC H. BETTS, ESQ., FOR COMPLAINANT *** BEFORE HON. JAMES J. PLATT, J.

June 15, 1904

Raymond R. Wile
Research Library

United States Circuit Court,

DISTRICT OF CONNECTICUT.

NATIONAL PHONOGRAPH COMPANY, *Complainant,* *vs.* AMERICAN GRAPHOPHONE COMPANY, *Defendant.*	In Equity. No. 1076. On Patent 667,662.
NATIONAL PHONOGRAPH COMPANY, *Complainant,* *vs.* AMERICAN GRAPHOPHONE COMPANY, *Defendant.*	In Equity. No. 1103. On Patent 713,209.

ARGUMENT OF FREDERIC H. BETTS, ESQ., FOR COMPLAINANT.

BEFORE HON. JAMES J. PLATT, J.

C. G. Burgoyne, Walker and Centre Streets, N. Y.

Raymond R. Wi
Research Librar

United States Circuit Court,

DISTRICT OF CONNECTICUT.

BEFORE HON. JAMES P. PLATT, J.

NATIONAL PHONOGRAPH COMPANY, Complainant, vs. AMERICAN GRAPHOPHONE COMPANY, Defendant.	In Equity. No. 1076. On Patent 667,662.
NATIONAL PHONOGRAPH COMPANY, Complainant, vs. AMERICAN GRAPHOPHONE COMPANY, Defendant.	In Equity. No. 1103. On Patent 713,209.

HARTFORD, CT., June 15, 1904.

Argument of Frederic H. Betts, for Complainant.

MR. BETTS—May it please the Court: It is not necessary for me, I think, to enter into any defense of the character and achievements of Mr. Edison as an inventor. History has given him a rank which few have equaled in the inventive field. And it seems to me that counsel for the defendant has strayed far afield

Raymond R. Wile Research Library

when he attempts to contest the issues in this case by an attack upon *other* inventions of Mr. Edison; or by proving that he has not only made some inventions of transcendant importance, such as the electric light, but has also patented other things which have not been held by the Courts to rise to the dignity of invention.

This case, I think, like most patent cases, is susceptible of being determined upon a pretty narrow issue, and the exact issue between the parties is generally ascertained by finding exactly what the patentee did, and claimed, and exactly what the defendant has done; to ascertain, in other words, what is the gist of the invention, and whether the defendant had used it; and that I think has not been adequately treated by my friend on the other side.

If your Honor will turn to the patent No. 713,209, on page 356 of Complainants' record in case 1103, which is the so-called generic patent in this case, and, for simplicity, to the third claim of the patent, on page 3, you will see exactly what it is that Mr. Edison claims:

> "3. The method of producing hollow cylindrical phonograms which consists in obtaining a mold having a reverse phonogram record on the inner wall of a cylindrical opening, forming a hollow cylindrical plastic phonogram within said mold, releasing the phonogram from the mold *by a reduction in temperature sufficient* to *entirely clear the surfaces*," (I ask your Honor to underline those words) "and removing the phonogram from the mold by direct longitudinal movement."

Releasing the phonogram from the mold by a reduction in temperature sufficient to *entirely clear* the surfaces. That is the gist of the new practice.

If your Honor will turn back to the specification, we get a little light upon what the inventor did. On page 2, at line 8, we find this statement:

Raymond R. Wile
Research Library

"The blanks which are to receive the duplicate record are preferably composed of a material having a higher coefficient of expansion than that of the matrix or mold, and said blanks are made sufficiently thick to maintain their shape" &c.

And again in the same column of the same page, line 33:

"By making the blank of a material having a higher coefficient of expansion than the matrix or mold the blank will be properly expanded to receive the impression of the record, notwithstanding the fact that both the blank and the matrix or mold may be subjected to the same temperature."

Below that, at line 57:

"After the blank has been expanded, so as to receive the impression of the matrix or mold, it is removed by first shrinking it radially in any suitable way, as in a refrigerating-chamber, and by then withdrawing the resulting duplicate record by a direct longitudinal movement."

And then in the next column on the same page, at line 84:

"The degree of heat necessary to properly expand the blank will depend largely upon the material of which the blank is formed and upon the closeness of fit of the blank when inserted within the matrix or mold. For the same reasons the extent of the reduction of temperature in chilling and shrinking the duplicate record will vary to a considerable extent."

And just prior to the claims, on the third page, line 46, we find this statement:

"After the mandrel has been forced within the blank it is immediately withdrawn, and the blank is then chilled in any suitable way, such as by

Raymond R. Wile
Research Library

placing the matrix, with the blank contained therein in a refrigerating chamber. In this way the blank or duplicate will shrink or contract radially, as shown in Figs. 3 and 3*a*, *sufficiently* to be *removed* from the matrix or mold *by a direct longitudinal movement.*"

If your Honor will look on the last page of the drawings, at Figs. 3 and 3*a*, especially 3*a*, you will find that the patentee there shows the surfaces *entirely cleared* of each other by the radial contraction.

Now, what I want to press upon your Honor's attention is this : That it is perfectly clear that Mr. Edison pointed out that the record, after it had received the impression in its plastic surface—because the expression of the claim is that it is a " plastic " phonogram—is withdrawn from the mold by a reduction in temperature " sufficient to entirely clear the surfaces." A reduction in temperature must be employed which is adapted, —as the specification shows in the passages which I have read,—to the character of the material which is being used. Some materials have a very high coefficient of expansion as compared with the material of the mold, others have a very much lower degree of excess of the coefficient of expansion and contraction as compared with the mold. But whatever be the degree of difference of expansion and contraction between the material and the mold, the directions of the patent are to *so apply* the reduction of temperature as, with any given difference of coefficients of contraction, the parts of the phonogram record will be " entirely cleared " from the surface of the mold.

As to that act, and that exact procedure with reference to the material of which the phonogram record is made, it is plain both from the defendant's testimony, and from the admission of their own patent that the defendants do the same thing. Your Honor will find the defendants' patent of Macdonald, in the red book of complainants on page 364. This describes the use of the ordinary material for phonographic records ;

Raymond R. Wile
Research Library

wax or wax-like composition—a mixture of two ingredients, such as stearic acid and ceresin, and this he says in the patent, is the ordinary material, that is, in 1901.

That is run into the mold in a molten state, and therefore, of course, a cylindrical plastic phonogram is necessarily formed in the mold.

It is then heated sufficiently to drive off the bubbles and impurities, and then, at line 79, the patent says:

> "I then admit cold water through inlet 2 and allow the steam to escape through outlet 3. This sudden application of cold chills the surface of the wax instantly and symmetrically and causes it to contract from the matrix surface *sufficiently* to CLEAR the *now solidified casting from the matrix* and *permit its withdrawal.*"

Of course that is an entirely equivalent and substantially identical statement of the step in the process of manufacturing these phonograph records to that which is recited in the patent in suit.

In other words, the withdrawal step of defendant's process consists in the application of such a degree of difference in temperature to the combined record and the mold in which it is inclosed, that, taking into consideration the character of the material of which the phonogram record is made, the contraction will be sufficient to entirely clear the surfaces and permit direct longitudinal withdrawal.

I think there can be no doubt about that being the meaning of that claim, and that such is the process of defendant.

Now the question is simply this: Was it an invention, did it involve invention,—say in 1894—for that was the time when Mr. Edison completed his experiments and showed that these records not only could be made in that way and that they were durable records, but that the mold was a durable mold, and that thousands of duplicates could be made in the same mold without substantial deterioration—Did it involve invention in 1894 to make

Raymond R. Wile
Research Library

phonographic records by applying the plastic material against the inside of a continuous mold, having the record in relief, and then shrinking the phonogram in the mold sufficiently to *entirely clear* the surfaces, and then longitudinally withdrawing the phonograph record?

It seems to us at the present time a very small and easy thing to do. It seems an easy way of making duplicates, to run them into the mold in plastic form and then withdraw them in the manner described; but I apprehend that the question whether any invention was exercised at that date is to be determined, not in the light of the knowledge of the present day, but in the light of the knowledge at the time when the invention was made, and having regard to the importance of the results which flowed from the making of the records in this way.

In the first place, it is admitted by the proofs on both sides that this way of making phonograph record duplicates, that is, by applying the material in a plastic condition in the inside of a continuous cylindrical mold and then getting the records out, not by opening the mold but by shrinking the material therein—not merely to loosen it, but to an *extent* which will *entirely clear* the surfaces and permit longitudinal withdrawal—is a *highly useful* method. It permits longitudinal withdrawal *so freely* that the delicately engraved surface of the record in that shape will not be marred or scratched, —that is the extent to which the contraction is to be carried,—Hence a process which consists of making duplicate phonograms in that way is admitted to be a most valuable contribution to the art.

Both parties are using it and using it to the extent of the manufacture of duplicates at the rate, if my memory serves me correctly, of many thousands of such records per day.

Indeed that way of making phonograph records lies at the foundation of the modern art of making duplicate phonograph records at all; I mean of molding phonograph records as distinguished from cutting them.

What was the way of making duplicates prior to

Raymond [illegible] Wile
Research Library

molding in a continuous mold and getting the device out—not by opening the mold but by contracting the phonogram record sufficiently? What way preceded that method?

The only known way of making a phonogram duplicate was by cutting. Bell and Tainter—and Tainter following—in their patents in 1885 and 1886, which are in the record, showed how you could make a duplicate phonograph record by cutting—by guiding a cutting tool, by a connection between it and the reproducing tool, which was running in contact with the record of the master cylinder.

If your Honor will turn to the patent of Young, which is in Defendants' Record at page 363, you will find an excellent statement of the state of the art, exactly in the year to which I have referred, 1894, when Mr. Edison first showed that he could take these molds and could duplicate from them to the extent of thousands without injury to the mold. This is what Mr. Young says, on page 363, as to the state of the art:

> "My present invention relates to a method of, and means for reproducing any number of duplicates or counterparts of sound records that have been engraved, indented or otherwise produced upon the rotund or cylindrical recording surfaces of phonographs, gramaphones, graphophones and similar or other sound recording and reproducing instruments.
>
> "In the most approved or latest type of instrument of the kind referred to, a surface of prepared wax has been found the most suitable upon which to record sound vibrations, and hitherto no better means has been adopted or known for reproducing such sound vibrations than by employing the self-same wax surface upon which the record has been taken for operating the recording diaphragm, and it is a well-known fact that whilst the said prepared wax is (so far as at present known) the most suitable material for such records, the same has but a short life when used for the purpose of re-

Raymond R. Vile Research Library

> pro.luction, and that the resonant sharpness of each reproduction is perceptibly less than those preceding it, this arising from the fact that the very nature and qualification of the material rendering it so adaptable for the former purpose" —that is, its softness—"is unsuited to stand against the constant friction of the reproducing stylus when used for the latter purpose, hence its short duration, and although the latest and most perfected machines of the kind referred to, are provided with a tool for shaving off the worn-out records in order that the same wax cylinder may be again used for recording purposes, the production of such records are, in some cases, very costly, and this, naturally, materially adds to the cost of the maintenance of the machine, but according to my invention as hereinafter set forth, I am enabled to produce from the record first taken, any number of duplicates or counterparts upon material capable of withstanding for a lengthy period, the friction arising from contact with the reproducing stylus."

There is a very accurate statement of what the condition of the art was.

In 1894 it was perfectly well recognized that it was a very desirable thing to duplicate phonogram records; and it was also recognized as late as 1894 that there was only one mode then known by which it could be done, and that was that you can take the original master record and use it as a guide for the tool which is to *engrave* the duplicate record.

I submit right here a suggestion, which I shall have occasion to elaborate upon later on. If it were true, as contended by my friend on the other side, that it was perfectly obvious that you could always make a phonogram record by molding it in a cylindrical mold and could then get it out without injury by the mere process of shrinking, how is it that no one had ever done that thing notwithstanding the admitted imper-

Raymond R. Wile
Research Library

fections and disadvantages of the old mode of making duplicates by the engraving process ?

It was not because the desirability of molding records had not been foreseen. Mr. Edison as early as 1878, sixteen years before 1894, had suggested the idea of molding these records. I ask your Honor's attention to page 412 of this same book, showing how ancient the suggestion of the desirability of molding, as distinguished from cutting, had been. On page 413 you will find, after Edison's description of the way of making phonograph records by indenting them, he says :

> " The cylinder having a spiral groove in its surface may be made by placing the mold shown in Fig. 62 around a cylinder or shaft, and filling the space between the cylinder and mold with plaster of paris or other suitable material. The mold is of metal with a screw or spiral rib projecting therefrom, and it is made in two parts and hinged so that it can easily be removed when the plaster of paris is dry."

Your Honor sees in Fig. 62 a two-part mold which is suggested by Mr. Edison.

We have therefore the fact that long before Mr. Young pointed out the state of the art as it existed in 1894, Mr. Edison had told the world that it was a desirable thing to mold such records; that the only suggestion that he had as to the way in which they were to be molded was to make them in a hinged mold, by which the phonogram record, when it had been filled into the mold and when it had been hardened, was freed from the mold, not by shrinking it out—not by the process of *self*-detachment from the mold—but by opening the mold and freeing it from the record by the force of manual operation.

My friend on the other side admitted that molding had long been recognized as the " ideal " method of making phonograph records. He admitted that there were difficulties which were inherent in that method. Then he went on to contend that Mr. Macdonald was the per-

son who removed the final difficulty. I shall have something to say about that further on. All I am now doing and the only proposition which I now make is this: That this was a very desirable thing to do, that it was recognized as an "ideal" thing to do, and yet up to this point, as the specification of Young points out in 1894, no way of doing it had previously been pointed out or put in practice as a substitute for the method of engraving the cylinders by a tool guided in its operation by the master cylinder.

Now, had efforts been made by inventors to mold records and get the records out of the mold under such conditions as not to involve the scratching or marring of that delicate record? Because the mere knowledge that you could get the record out is not enough. You have got to devise some way of getting it out which will not mar the delicate surface of the record. Mr. Edison himself in his English patent, to which I have called your Honor's attention, suggested that you could do it with the split mold, but that had not come to anything; and in 1888, ten years later, Edison applied for what is called in this case his "split mold" patent, in the United States, in which he showed an improvement over any suggestion made in his English patent. He proceeded to make a mold which was cylindrical, which bore a record on its inner face, which was produced in a particular way, by covering the master record with a vacuous metallic deposit, and then electroplating upon it, and then backing up the electroplate, and thus forming a mold which had an exceedingly fine, smooth surface. He had gone as far as that, to get a perfect mold so far as the surface was concerned; but his only suggestion as to how you could get that record out of even that superior mold—a mold just as good as any that can possibly be produced at the present day—his only suggestion was, *open* the mold. In other words, do not apply any step or treatment to the record which will cause it to detach *itself*, under such conditions that it can be got out without marring its delicate surface;

Raymond R. Wile
Research Library

but *pull* the mold *apart;* apply the force of your hand or of machinery to take away the mold from the record.

That of course did not involve the present patented method of withdrawal, by carrying the shrinking operation, by such a reduction in temperature, so far as will entirely clear the otherwise interlocking surfaces of the mold and record; entirely clear them; clear them to such an extent as to permit longitudinal withdrawal without fatal effects upon the record itself.

Well, what other inventors tackled this problem? Mr. Lioret, in the patent which he took out in 1894 made a suggestion. He made a peculiar mold; he made a mold with a screw-thread in it, and at the bottom of that screw-thread in the mold as it was completed, was the delicate pattern which formed the record. Did he have, or did he point out the idea that you were to apply a reduction in temperature to the material, of which that record was made, sufficient in extent and character to "entirely clear" the surfaces from each other, and permit longitudinal withdrawal? I do not think there is so very much in the mere act of longitudinal withdrawal itself, which characterizes this process. It is the 'entire clearing" of the surfaces to such an extent as to *permit* 'longitudinal withdrawal.' That is the very point at which Mr. Lioret fell short. He did not perceive, and he did not point out, that you should adapt the chilling and shrinking process to the extent necessary to entirely free and clear the surfaces from each other. He stopped short of that and said in effect, "I loosen the surfaces from each other by putting the mold in cold water, and then I *unscrew* the surfaces." He did not clear the surfaces entirely from each other; he left them interlocked and then he attempted to get the record withdrawn from the mold by an unscrewing action, which, as every one admits, is absolutely fatal to the integrity of the record.

Here, therefore, was another inventor to whom this idea, which is so simple to us now, of carrying the shrinking process, not to *some* extent, but to the

Raymond R. Wile
Research Library

specially *required* extent, was not obvious. That inventor failed in the conception, both in its fullness and in its entirety.

Then we have another inventor, Mr. Young, who, as I have pointed out to your Honor, in the preamble of his patent of 1894, so fully recognized the difficulty.

He had the Lioret patent also before him, and what was his suggestion? He knew that he wanted to get a molded duplicate. He knew he wanted to get a process by which molded duplicates could be formed indefinitely, cheaply, of harder materials than the soft material of which engraved duplicates must necessarially be formed. He had the whole state of the art before him; he had the exigencies and requirements and needs of the art before him; and what was his suggestion? He said, "I take a little tube of celluloid"—it might have been other material—"very thin, and I expand that by pressure, when it is in a softened condition, against the interior of the mold." And then how did he get it out? By shrinking? No, by "collapsing" the little tube, on account of its great thinness; a suggestion entirely separate and entirely different from Mr. Edison's conception contained in the patent in suit, of having the record one which is of considerable thickness, as he says,* made of materials which have sufficient contractability, under the action of refrigeration, or lowering of temperature, and then applying such a graded, adapted system of cooling that the shrinking will be carried to such an extent that the solid record—not the thin tube of Mr. Young—can be freely withdrawn without damage to the pattern which it bears on its surface.

Now I submit that here we find three inventors, Mr. Edison in 1888, Mr. Lioret, in 1894, and Mr. Young, in 1894, who had the problem before them in all its fullness, and yet who failed to make this conception, which really has lain at the base, and to-day forms the

---

* See Patent No. 713,209, p. 2, line 12.

Raymond R. Wile
Research Library

foundation, of successful duplicating by the molding process. Under these circumstances I submit that it cannot be said that the mere knowledge that contraction in *some* degree would take place,—enough to loosen a blank or a record in its mold,—was sufficient to teach that contraction, carried to such extent as to sufficiently clear the surfaces, was a practical way of freeing and getting out these records from their surrounding molds under such conditions that the integrity of the records would be preserved.*

My friend on the other side recognized the point that it had long been known that molding was an "ideal" process, and it did not come into commercial and practical use by either of the two concerns, parties to this suit, who are certainly alert and alive to all improvements that are made, until years after it had been recognized that it was an ideal method; he recognized, too, that "somebody must have made an invention somewhere along the line," and he said he thought Mr. Macdonald made that invention. He claimed that

---

* In *Thomson-Houston* v. *Elmira Co.*, 71 F. R., p. 401, the Circuit Court of Appeals for this Circuit (speaking by WALLACE, J.) said, overruling a similar contention of non-patentability of a simple expedient:

> "Various expedients for switching with such conductors have been resorted to by experts in the art. The fact that they overlooked devices like the patented device, and resorted to clumsy or inconvenient means, cannot be ignored. It was not a great invention, but that it was an invention requiring a degree of ingenuity somewhat beyond the ordinary skill of the calling we are unable to doubt."

In *Brunswick* v. *Thum*, 111 F. R., 904, the Court of Appeals for this Circuit, (speaking by LACOMBE, J.,) said, in overruling the contention that the use of a rising incline in a bowling alley trough to stop the momentum of return balls, was unpatentable, said:

> "Various devices were contrived, all of them, save one, independent of the trough itself, * * * So many of these devices are shown that it is apparent that the skilled mechanics were for years trying to find some way properly to retard the ball, and the proof conclusively shows that all of them were unsatisfactory. * * * In the face of this evidence, we cannot hold that his improvement is devoid of patentable invention."

Raymond R. Wile Research Library

the great trouble was that the material was a material full of air bubbles, and that unless you could get the air bubbles out you could not cast the material in a mold so as to make a good record. He claimed that Mr. Macdonald came along in 1895, and invented the application of superheating to the material in the mold for the purpose of freeing it from the air, and that *that* was the solution of the difficulties.

Now mark, your Honor, that it is to be fairly presumed, that Mr. Macdonald, as well as every one else, had long recognized the fact that "molding," if it could be practiced in the making of phonograph records, was the "ideal" mode of doing it; and yet what was the history of Macdonald himself after he had, as he said, invented, in 1895, the superheating process?

Did he then immediately make the molded records? If it was he that removed the last obstacle in the way of success why didn't he make molded records in 1895?

But as matter of fact it is not until 1900 or 1901 that Mr. Macdonald takes the ordinary material and does, as I have shown, in his patent, exactly what Mr. Edison had pointed out, and what Mr. Edison had done as early as 1894, that is, to carry the process of shrinking to a degree, to an extent, which, taking into account the character of the material used, would be sufficient to entirely clear those surfaces and permit the withdrawal of the record without damage to its surface. Mr. Macdonald's own history shows that the invention of superheating was *not* the thing which stood in the way of ultimate success, because, although he says he made the invention of superheating as early as 1895, it was not until 1900 or 1901—and his patent was applied for in November, 1900—that he arrived at any process of making the phonograph records in this way; and then he did exactly what Mr. Edison teaches.

The real difficulty was that no one had discovered that by carrying the shrinkage of *records* to an extent which would entirely clear their

Raymond R. W
Research Library

pattern from the mold,—as distinguished from a mere looseness,—that that was a practical way of getting those records out of the continuous mold, without marring their surfaces.

Let us look at this question of the alleged obviousness of doing this thing which Mr. Edison did—simple as it now seems to us—a little more closely.

A phonograph record is a very peculiar thing. It is covered with a microscopic pattern of extreme delicacy. My friend Mr. Dyer gave me an illustration of the delicacy of that pattern on the surface of a phonograph record, which struck me as impressive. He tells me that a page of this printed record is about the size of the surface of one of those record cylinders, and if that record was covered with characters as numerous as the letters on a single page we would be apt to consider that the record was a very complicated and elaborate and delicate piece of work, if the form of every letter was to be preserved. He tells me he has made a calculation by which it appeares that the average number of the little depressions and elevations which correspond to changes in sound on a phonograph record surface is about ten thousand times as great as the complications of characters of the size of those on the printed page of this record.

That is the delicacy of the thing that we are dealing with. It is not enough to get a phonograph record out of a mold. Everybody knew that you could get it out if you used force to get it out, if you did not have to preserve your surface. The thing was to devise a way of getting records out which would not mar their surfaces,—a surface of the delicacy and complexity of which I have spoken.

Now, in dealing with such a thing as this phonograph record, with its complex surface, actions which are almost microscopic in their own character may become of the highest importance ; and we cannot judge of the importance and the obviousness or non-obviousness of the action as applied to a device of that kind, without taking into consideration the fact that we

Raymond R. Wile
Research Library

are dealing with microscopic things ; and microscopic differences sometimes, viewed in a purely structural way, are differences of the highest importance. Differences, which are mere differences of degree in other and larger things, are differences of kind, or may be such, as applied to the phonograph record, because we are dealing with a supremely delicate object.

It was by no means obvious, as shown by the efforts of the other inventors, that shrinking so as to entirely clear the surfaces, and by this alone securing the capacity for withdrawal, was a practical way of getting out the record from its interlocking mold.

This step in the process of making a successful phonograph duplicate is based on a discovery that the mere application of the proper temperature, when considered in relation to the character of the material in that mold, will cause a self-detachment of that record, with its microscopic surface, from the corresponding interlocking microscopic surface of the mold, and will produce an extent of clearance that will permit the longitudinal withdrawal of the record.

No one had ever done this before. Mr. Edison had tried to open his mold, in 1878 and 1888 ; Mr. Lioret had loosened and unscrewed his record in 1894 ; Mr. Young in 1894 had put an exceedingly thin tube of record material in a mold and then had *collapsed* it for the purpose of getting it out.*

Could your Honor, without discovery, without "invention," without trying it and ascertaining the fact, after the conception had been made, necessarily arrive

---

* The invention lay in conceiving of this mode of withdrawal, and in perceiving that it was a practical and valuable mode, and in then putting it in practice with most beneficial results (*Edison Co* v *Electrical Co* 66 F. R. 309).

In *Strong* v. *Noble*, 6 Blatch., 477, 479, Judge BLATCHFORD had before him the defense of non-patentability of a knit fabric as a covering for the handle of a whip, and in overruling the defense, said as follows :

> " There is scarcely a patent granted that does not involve the application of an old thing to a new use, and that does

Raymond R. Wile Library

at the conclusion that mere shrinking, by an application of the lower temperature, would be a practical way of freeing the record surface from the other interlocking surface?

That record surface has been forced, either by the expansion of the material or by the heated, molten condition of the material, or by mechanical pressure, into the pattern of the mold.

Would your Honor know, without trying it, that shrinking, and shrinking alone, would be sufficient to detach those surfaces from each other without marring the record? That depends upon the degree of *ad*herence between the material of the record and the surface of the mold. It depends also upon the degree of molecular *co*herence of the material of the record itself, because every little projection of the record has got to be dragged out of the corresponding depression in the mold simply by the coherent strength of the material itself, acting under the influence of the shrinking of that material by the proper application of cold. I submit it was a bold thought, that all the difficulties in the way of securing molded duplicates, without impairment of their surfaces, could be removed by the simple act of treating that duplicate in its surrounding mold to such a fall of temperature and shrinking, as to entirely free one surface from the other—free it to an extent which would permit longitudinal withdrawal. Mr. Edison discovered and applied that fact, which no one else had discovered before him; and he thus became the father of the molded-duplicate art.

---

not, in one sense, fail to involve anything more. But the merit consists in being the first to make the application, and the first to show how it can be made, and the first to show that there is utility in making it. In the present case, the points of advantage, set forth in the specification, as attending the invention, are ornament, economy, and durability. It could not be told necessarily, *a priori*, without experiment, that these advantages would accompany the application of the knit fabric as a covering for the whip."

Raymond R. Wile Research Library

I submit there was nothing in the process of molding 'blanks' which taught this—blanks whose surfaces were intended to be smooth, and which were afterwards to be engraved; which had been molded in a mold, having a more or less smooth, or perhaps a more or less roughened surface—irregular roughness.

True it had been recognized in connection with the making of those blanks in a tubular mold that a certain amount of shrinking took place. It did not appear by anything that anybody had ever done, or ascertained, or found out, that that shrinking was of a character which would leave a "record" surface intact, or unimpaired in the delicacy of its tracing.

That was not an object in getting a blank out of its tubular mold. The blanks were detached from those molds by forcing them out while still in a partly plastic condition, and there was no thought of preserving a record on the surface, for there was no record to preserve, and it was unimportant whether the surface was marred or not because the blank was afterwards to be turned down by a lathe. That is one way in which those blanks were gotten out. Another way was by oiling the interior of the mold or oiling the exterior of the core. Perhaps both surfaces were oiled. In that way the withdrawal by reason of the lubrication could take place. In connection with both those methods of taking a blank out of a mold it was realized that a certain amount of contraction took place, that there was a loosening of the surfaces. But that that loosening could be made the efficient means, *by itself*, of getting out a tubular body such as a record from the interior of the tubular mold without marring its surface, never occurred to anybody, because it was not involved in that "blank" practice at all.

My friend on the other side had to admit, and he admitted fairly, that the shop practice was always, in making these blanks by molding them, either to push them out when they were partly plastic, and therefore the surfaces could not be preserved, in whatever shape it was; or by oiling or lubricating the parts so as to get them out, which of course would be entirely impos-

Raymond R. Wile
Research Library

sible where you were endeavoring to preserve a microscopic pattern. My friend refers to a statement made by Mr. Frank Dyer, at page 41 (C. R., 1103), in which he at one time seemed to make an admission that for ten years previously he had known of blanks being taken out by shrinking. Mr. Dyer afterwards corrected that (*Ibid.*, p. 89); he said he had no personal knowledge of any such thing. It was very evident that the practice, as proved, by those who are familiar with the art, was not to merely shrink to get blanks out of the tubes, but while shrinking to slightly loosen the blank in the tube was known, yet the practice really was to get it out by lubricating either by the oil which had been pre-applied or by the lubricating action of the plastic condition of the material itself.

There is nothing, I submit, therefore, in the dealing with phonograph blanks which would teach that shrinking, applied to an extent to entirely clear the surfaces, would be an efficient way of removing, without destroying the delicate microscopic surface of a phonograph record.

Well, but my friend on the other side says, this is not a "process" that is described in the patent.

He says a process is "the treatment of certain ma-"terial to produce certain results; it is an act or "series of acts performed on the subject matter to be "transformed or reduced to a different state or thing."

Surely, here is a case where the material is to be transformed into a phonograph record. When the material is put into the mold it may be a liquid; it may be plastic, or in a more or less plastic condition. It is a thing; it is a piece of material; it has no use in that condition; it has got to be "transformed" into something else, and that something else is a phonograph record. Moreover, the thing into which that material is transformed is a phonograph record of a particular kind. It is a phonograph record which may be made harder than any of the old engraved phonograph records, because you are not now limited to the use of material which can be cut into by a

Raymond R. Wile
Research Library

delicate knife, but you can use a much harder and more durable material, as Mr. Edison in the patent in suit clearly points out. Therefore the result of this process of transformation of material into a phonograph record, not only results in a phonograph record, but a particular kind of phonograph record, an improved kind of phonograph record. It is harder, more enduring and also is more accurate than any phonograph record which could be made by the process of cutting by a knife guided by the action of a recording instrument.

What are the " acts " which are performed on this material by this process of transforming ? The acts are, first, applying the material in a condition of sufficient plasticity to take the impress of the die on the interior of the mold ; bringing it into contact with the die by reason of the liquidity of the material itself, or by the softened condition of the material under the expansion of its own expansive powers ; or by forcing it mechanically in its plastic condition against the interior of the mold.

Then what other act is performed upon that material to enable it to be made into a usable phonograph record ? It is subjected to such a fall of temperature as to free it entirely from the mold and to permit of direct withdrawal. That act of applying a lowered temperature adapted to the particular material which is in the mold, and carried to an extent sufficient to entirely clear it, is just as much of an " act " as it would be to apply mechanical pressure, which would be recognized in an instant as a step of a legitimate process.

I submit then that in that broad patent No. 713209 there was a conception, which now seems to us simple, which was vital to the success of making molded duplicates. The practical carrying out of that conception has resulted in a vast improvement in the art of making molded duplicates which are harder, more durable, better than anything which had preceded. It is a process the final step of which consists of freeing the material from the mold by causing the material itself to detach itself from the mold as distinguished from

Raymond R. Wile
Research Library

the process of opening the mold and letting the material out. I submit that that is a patentable thing, as applied to this art.

Now let us turn to the second patent. Before passing to that, let me say that my friend paid very little attention to this patent No. 713,209. He put his whole strength on the 'casting' patent, No. 667,662. I thought he sometimes made statements which are apt to be confusing, perhaps misleading, unless you carried in your mind the distinction between the second patent and the first. When I say the first I mean the first in the order of application.

What is the second patent, No. 667,662, for? Your Honor will find it on page 314. Let us take the second claim of that patent, because the fourth and fifth are substantially similar to it.

> "The process of duplicating phonographic records, which consists in securing a mold containing the record in negative on its bore, in introducing a molten material in the mold to receive a surface impression from such record"—

That is the first distinction; a *molten* material; molten in the sense of being liquid.

The other patent, No. 713,209, did not describe *that particular kind or degree of plasticity.* Its claim covers the use of a plastic phonogram in the interior of the mold but does not point out that the degree of plasticity shall be carried to the extent of being 'molten.'

> "in allowing the molten material to set."

There is a new standard. Material which is solid and only plastic does not "set" in the sense that a liquid sets.

> "in contracting the set material, and in separating the contracted molded material by a longitudinal movement, substantially as set forth."

Raymond B. Wile
Research Library

In other words, this claim differs from the claim of the patent of earlier date of application in the fact that it defines the kind of plasticity of the material which is to be used, in that it is to be molten material and that the molten material is to be allowed first to set—and the proof is that in setting it generally, if not always, expands—and then contracting it the degree necessary for its withdrawal. That patent therefore stands upon this question :

Was it an "invention," after Mr. Edison had pointed out in his earlier application of 1898, that you could take material in a condition of mere plasticity—plastic enough to take an impression from the inside of the mold and then could shrink it out—was it obvious that you could make a practical phonograph record by applying the material in a *molten* condition, and then first letting it *set*, and then after it has set contracting it or shrinking it to a degree to take it out?

It was a very useful idea and it resulted in better records. If your Honor will turn to the defendants' book, the red book, at page 123, you will find what their own expert says on this subject. It is at folio 179, page 123 :

> "The casting method is simpler, cheaper and produces a better duplicate."

The "casting method" is equivalent to saying, apply the material in its molten condition and let it set, and then shrink it and then withdraw it. It is better, cheaper and makes a better record. Clearly, therefore, we have a case of "improvement" on the specific form of dealing with the material which was disclosed in the earlier application, and the question is whether that is an "invention." It is admitted by Mr. Edison that although he made his records in the way described in his earlier application by applying the plastic phonogram in a more solid form of material in the interior of the mold and got very good records—he got thousands of them without impairing the integrity of the

mold—that there were great difficulties in the way of using *molten* material. One of the difficulties is said to have been that the material must be non-aerated. Mr. Edison did not encounter that difficulty in his earlier form of this generic invention, because he applied the material not in a molten condition, where it would be possibly filled with air bubbles, but he applied it in a comparatively solid form of plasticity. When he came to the second patent in suit, 667,662, he showed a way in which aeration was prevented by introducing material from the bottom. The defendants say they have got still another method, that of removing the air bubbles by superheating. Now, the particular way of removing aeration is not of the essence of this invention, but it was a difficulty in the way of perfecting the invention, of using *molten* material; and it is one reason why Mr. Edison did not perfect that modification of the original invention nearly so early as he did the original invention itself. He made an experiment as early as 1888, but it was not until, as he says, he discovered that certain materials, that is, the metallic soaps, could be utilized in a molten condition, that he succeeded in practically applying and perfecting *this* invention. His patent No. 667662 is very distinct on that point. When he comes to the molten condition of the material he says:

> "My present process"—that is, applying the material in a molten condition—"depends upon the fact that after a molten metallic soap or a mixture of soaps or other suitable material has been introduced within a mold carrying the representation of a phonographic record in relief on its bore and allowed to set a sufficient contraction of the resulting duplicate can be secured as to permit of a longitudinal separation."

In other words, he had to find out a material or class of materials which would permit the use of the casting method before he could consider that casting method

Raymond R. Wile
Personal Library

perfect or a fit subject for a patent. And that is what he did; he found out that metallic soaps, when molten, would do the work, although other materials would not; and I presume if he has shown one material and described one material which can be cast in that way, and if he was the first person to successfully cast in that way, he is entitled to a broad claim for dealing with the material in its "molten" or "casting" condition; that at all events he is entitled to such a construction of the claim as will cover the application of the process of casting that material, or material of that character; and that is the kind of material these defendants use; and whether that patent be construed broadly for casting any material which is suitable for the purpose, or whether it be limited to the use of the class of material on which Mr. Edison says his invention "depends," does not now make any difference, because the defendant uses a material of that class, which Macdonald says is a well known material to be used for phonograph records,

But think for a moment. Would it be obvious to your Honor because you had taken a comparatively solid phonograph material and had pressed that into the interior of the mold, and found that it would detach itself from the mold without injury to the record and would shrink sufficiently and with such regularity as not to impair the record and permit it to be taken out of the mold—would it be necessarily obvious that you could do the same thing with "molten" material? A molten material is more *ad*hesive to the mold than a mere plastic material. A molten material is less *co*herent to itself, in its molecular structure, than a material that has greater solidity of body. Could anybody tell, without trying, that you could apply molten material of any kind, whether of metallic soap or otherwise, successfully, then allow it to set, then contract, and yet free itself from the record in such a way as to produce a perfect phonographic record? I submit that it was not obvious.

If Mr. Edison, then, was the first person to apply a material in any condition of plasticity, in any condition or any degree of softness by heat, so that it would

Raymond R. Wile Research Library

take by contact or pressure the impression of the record on the interior of that mold; and if he discovered that by applying a properly regulated process of shrinking, by the lowering of temperature, he could cause the record to self-detach itself from the mold, he is entitled to the broad claims 2 and 3 of his first patent No.713,209.

And if he was the first one to make the improvement which consists of discovering and applying certain special materials in a "molten" condition, which are adapted to work in a molten condition, so that they will self detach themselves, when setting and shrinking, from the mold, I submit that he is entitled to hold the claims of his second patent No. 667,662.

That, as it seems to me, is all there is in this case, except the one subject, which was not very fully treated by my friend Mr. Mauro in his argument, the alleged "double-patenting", *i. e.* that the invention of the patent which first issued was substantially the same as the invention of the patent which issued last; and that the validity of the patent which issued last, although based on the earlier application, is impaired by the fact that Mr. Edison had taken out a patent in the *interim*, which described the "casting" process or casting modification of the condition of the applied material. If I am correct in the position that the casting was an *improvement* upon the generic process of the first patent, that it was a particular kind of plasticity which presented difficulties of its own, and was in the nature of an improvement upon the general process which was made the subject of the generic claims, then of course we have no condition of 'double-patenting.' The fundamental rule is, if a man has made one invention he can only get one patent. If he has made two inventions he can have separate patents for those two inventions and the order in which they are issued does not make any difference at all.

If his generic invention was utilizable, as it clearly was, and valuable, applied to any condition of plasticity of the phonogram record, that is one invention.

Raymond R. Wile Research Library

If Mr. Edison subsequently discovered that he could get a better result, a cheaper result, by using the material in a casting or molten condition, that is an "improvement." It does not make any difference whether it is legally patentable or not, whether it involved a separate invention or not; it is a different *thing* from the generic invention.

The cases cited on our brief are all conclusive upon that point, and I hardly thought that the argument of our friend Mr. Mauro impugned that position.

Some contention is made that Mr. Macdonald was ahead of Mr. Edison on the "casting" process. Let us take Mr. Edison's date of invention, which was at least as early as the date when he filed his application for the patent, May 8th, 1900. Let us see what Mr. Macdonald had done before that. In Defendant's Record in case 1076 at page 52 you will find the first statement of Mr. Macdonald's doings in this regard. He says:

> "A. My first attempt at molding blanks was in July or August, 1889."

He is now talking about molding *blanks;* not about molded "records."

> "Q. Please describe how the blanks were made in 1889, as referred to in your previous answer?
>
> "A. The experiments that I made at that time were only remolding of broken Edison blanks. The experiments were for the purpose of ascertaining if it were possible to place this mixture on a solid base, such as wood or fibre or other substance that would make a stronger blank than that then in use for the phonograph. The mold consisted of a piece of brass tubing, about two and one-half inches in diameter, inside, and about six inches long. Inside of this was placed the core that I was experimenting with and the wax was melted and poured around it. After it was cooled

Raymond R. Wile
Research Library

I removed the blank so made and turned it down for use upon the phonograph.

"Q. How was the article removed from the mold?

"A. When it became cool it dropped out of the tube and drew it out; it came out quite easily.

"Q. Does this particular material have a high co-efficient of expansion? A. It has.

"Q. Did you in 1889 experience any difficulty in withdrawing the molded article from the mold?

"A. Not if we allowed it to become sufficiently cool, as soon as the wax cooled it would come out easily; we found that it shrank very much, so much so that *it spoiled all of my experiments*, as it would contract down on my core and usually split before I could do much with it."

That is as far as he got in 1889. He was dealing with *blanks*, and not with records. He says he recognized that there was some contraction but that contraction was of such a character that it 'spoiled all of his experiments.'

A little later on, at page 54, he is asked:

"Q. What was the character of the surface obtained in that way?

"The surface was very smooth and a perfect reproduction of the interior surface of the brass mold. We found, however, upon experiment, that it was very much harder than the ordinary shaved blank, so much so that it was *not practical for use in record making.*"

So that *came to nothing.*

Then he says that he made some apparatus in 1895, though it might have been in the early part of 1896 (p. 56).

"Q. How far back are you able to say with certainty that this apparatus was used by you in the way you have described?

Raymond R. Wil
Library

"A. I should say with certainty it was used prior to the first of June, 1896."

That was an apparatus for making *blanks*, but with which he says he observed that the wax blank would take an impression of any marks on the interior surface of the mold.

Page 57:

"Q. When did you first employ your process with a mold that had a sound record in negative on the interior?

"A. In the months of February or March, 1899."

Now we are getting down ten years later than the original experiment. This is February or March, 1899, when he employed his process with a mold that had a sound *record* on the interior.

Page 58:

"Q. Where did you procure the matrix that was first used with that apparatus?

"A. When the subject was first talked of, one of the workmen in the laboratory stated that he had a friend who was an electrotyper, and that he thought he could electrotype one of these cylinders, and that if I had no objection he would be glad to have him do it. I instructed him to have that done. When the matrix first came to me, however, it appeared to be so poor from a mechanical standpoint that I did not at once use it; in fact, had *thrown it aside in the laboratory as not good enough to waste time in experimenting upon*, and had made preparations to, if possible, get a better piece of plating done in the factory. But finally decided to try out the experiment with the matrix as it was. The results were such as to cause me to press the experiments then in that line as rapidly as possible."

Raymond R. Wile
Research Library

Page 59:

"Q. Complainant's witness Pierman testifies to having had knowledge of your molded record work in the latter part of 1899. What apparatus were you then using?

"A. I was *experimenting* with this mold which I have just described. I was also doing some *experimenting* with the cast iron steam jacketed mold, which I have previously described, and also with a steam jacketed mold which was afterwards actually used for commercial product."

Page 60:

"Q. When was the making of molded sound records put on a commercial basis at the factory of the American Graphophone Co.? I mean when were the first molded sound records made for commercial product?

"A. The latter part of 1899 we obtained some records which were used as masters on our duplicating machine. This would probably be the first time which we used a molded record in a commercial sense."

We have therefore his experimenting brought down to the latter part of 1899. On page 63 he is asked:

"Q. You do not claim to have made a molded duplicate *record* before 1899, as I understand it?

"A. I *do not.*

"Q. So that all of your work with the 1895 mold, which has been introduced here, related to the manufacture of *blanks?*

"A. The experiments I carried on at the time the mold was made in 1895, were only with a view to making *blanks*, but the mold was used in 1898 and 1899 with the *view* then of making molded records.

"Q. Did you use it in 1898 for this purpose?

"A. Possibly not in 1898; certainly in 1899 I

Raymond R. Wile
Research Library

used it for a considerable time to *ascertain* how accurately a molded record or an article molded in cylinder wax could be made; all with a *view* to making the molded record *when a suitable mold could be gotten.*"

Page 65:

"Q. Did you contemplate making anything in 1895 other than blanks?

"A. *I did not.*

Page 64:

"Q. After you made your experiments with the 1895 mold and found that you obtained a blank having such a hard surface 'that it was not practical for use in record making', as stated by you in answer Q. 26, what did you do with this mold?

"A. *It was laid aside in the laboratory.*"

He afterwards corrected those dates—page 80 of the same record, as follows:

"A. In the answer to Q. 56 the year should be 1900 instead of 1899, and the year 1900 should be the year 1901. Molded records were first used commercially in the month of November, 1900. They were put on the market probably about the beginning of the year 1901."

I submit, then your Honor, is there anything in those loose statements of Mr. Maccdonald, in which he finally admits that everything that he had done was *simply in the nature of experimenting*, and came to nothing of a commercial character, until November, 1900, which is going to anticipate the priority of Mr. Edison in this patent 667,662, which was applied for in May, 1900, six months before?

I submit that there is no evidence before you of the priority of Macdonald.

Raymond [illegible] Wil
Research Library

The only substantial attack that was made upon our primary patent 713,209, seemed to me to be an attack on the history of that application in the Patent Office. It was alleged that Mr. Wurth in the course of the application for the patent made an affidavit in which he spoke of the condition of the material which was used in the interior of that mold, as not being really softened and not being in a really plastic condition. It is perfectly plain from the character of the description, which among other things calls the material "viscous material" (Patent, p. 2, line 53), that it was a material which was in a *soft* condition, *sufficiently soft* to take the impression of the mold, and sufficiently soft to take the impression of the mold with the utmost accuracy, and therefore under any circumstances having a degree of real plasticity. It is unnecessary to *call* it *plastic*. That is *necessarily* true because the material was to take the impression of the mold. That affidavit of Mr. Wurth was intended to meet a reference to the Lioret and Young patents; and, as often takes place in proceedings in the Patent Office, the attorneys or parties prosecuting an application sometimes get a pretty fine spun theory in order to distinguish the case from cases which are cited against them. I think it sufficient that the Patent Office gave no support to the position that was set out in the affidavit. They granted to Edison, *notwithstanding*, the claims which expressly call for the use of a "*plastic* phonogram" formed in the mold; and, after that affidavit was filed, the Patent Office determined the fact that that patentee was entitled to cover plastic material generally by putting him into interference with the rival application of Joyce, in which the material was not only plastic in a certain sense, in the sense of being softened, but was actually plastic in the sense of being reduced to a *molten* condition. The two applications of Edison and Joyce were put into interference with each other as describing, in the judgment of the Patent Office, *substantially* equivalent conditions of material.

They allowed to Mr. Edison, subsequent to that, and

Raymond R. Wile

I think on the suggestion of the Patent Office officials themselves, the claims which are in issue in this suit, and which expressly call for the phonograph material being plastic phonograph material.* I submit therefore that there is nothing in the history of the Patent Office which shows that the Patent Office considered the first application to be anything except what it purports to be on its face, to wit, a process in which the phonograph material is applied in a plastic condition of some kind, some degree of plasticity, to the interior of the mold, and is then freed from the mold by the process of self-detachment, brought about by the application of such a degree of lowering temperature as will entirely clear the surfaces from each other.

This thing had never been done before, and had never been suggested by anybody else.

It was quite out of the line of thought in that direction, and has resulted in this most important branch of successful manufacture.

I thank your Honor.

---

* "Plastic" means sufficiently soft to take an accurate impression from the mold. Edison clearly described that.

Raymond B. Wilson Research Library